**Rates of Reaction (Level 1) examiners tips: Read these please!**

#### • name the specific particles involved in the reaction *eg hydrochloric acid* as opposed to just acid

#### • you must use the following phrases when explaining collision theory....

#### 1) general sentence regarding the FACTOR affecting the rate of reaction *- a higher concentration so there are more particles in the same volume* – IMPORTANT!

#### *or*

#### *- a higher temperature so the particles gain kinetic energy, move faster and because the particles have more energy there is greater chance of the collisions being successful*

#### *or*

#### *- a smaller size so a greater surface area, more of the solid substance (eg CaCO3) exposed for attack by the (eg acid HCl)*

#### 2) statement regarding the FREQUENCY of collisions

#### *so there is an increase in the number of collisions per second/frequency of collisions* – IMPORTANT!

#### 3) statement regarding the SUCCESS of collisions

#### *so there are more successful/effective collisions*

#### (please note that no reaction will occur if particles politely bump into one another...particles must SMASH into each other for a reaction to occur)

#### 4) Finally, a statement about the RATE of reaction

#### *so the rate of reaction increases*

|  |  |
| --- | --- |
| To summarise you must discuss the following in your rates of reactions answers… | Factor |
|  | Frequency |
|  | Success |
|  | Rate |

#### Some other statements to be aware of are…

#### • a catalyst is not used up in a reaction but speeds up the rate of a reaction.

#### • a catalyst allows more successful collisions to occur by lowering the activation energy.

#### • at a lower temperature, fewer particles have enough kinetic energy to overcome the activation energy

#### barrier (this is Level 2 information)

For Excellence be sure to explain e*g that the same amount of product (usually gas) is produced due to the same amount of reactants, and that factors such as change in concentration, temperature or surface are only affect the rate at which the product is produced*

**Also…”don’t be daft”**

reactions involve **collisions between particles** – write this down!

refer to the **names** of specific particles mentioned in the question

a **horizontal line** on a rate of reaction graph shows that the reaction is **over**, so no more *eg gas* is produced

don’t bother mentioning any variables other than **concentration**, **temperature** or **surface area** (particle size)

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